

STRAIGHT WIRE ARMATURE

BACKGROUND OF THE INVENTION

- [1] This invention relates to an alternative approach to the production of electric motor armatures. A rotor casing is provided with a plurality of circumferentially spaced straight wire bundles.
- [2] Electric motors typically include a stator and a rotor, or armature. An electric current in the stator causes the rotor to rotate through a magnetic field.
- [3] Electric motor armatures typically include a cylindrical rotor around which copper wire is coiled. Winding the copper wire in coils around an electric motor rotor casing is a time consuming and expensive assembly operations.
- [4] Typically, the procedure requires holding the rotor casing and winding or wrapping the wire from a single copper wire roll. The single roll is used such that the entire coil is electrically connected. After the first coil is wound, the wire is cut. The rotor casing must then be repositioned, and the wire is wound again. This process is repeated up to a dozen times for each rotor. Since the wire is pulled from the wire coil, breakage and stretching is common
- [5] It would be desirable to provide a process for more efficiently manufacturing an electric motor armature with the same electrical characteristics as a traditional armature, but at a much cheaper cost.

SUMMARY OF THE INVENTION

- [6] In a disclosed embodiment of this invention, an alternative process replaces each wire coil of the prior art electric motor armature with a plurality of circumferentially spaced straight bundles of wires. Since the wire bundles are straight

and not pulled from a single copper wire roll, breaking and stretching of the wire is greatly reduced.

- [7] In the inventive process, sets of straight wire bundles are molded or otherwise encased around a rotor casing. The ends of the straight wire bundles are then electrically connected by way of a circuit cap. The circuit cap utilizes soldering pins or similar technology to function as connecting pins to connect each wire bundle. Each connecting pin corresponds to a connecting pin mate on the circuit cap. A plurality of PCB board-type circuits may be embedded within the circuit cap and connect each connecting pin to its corresponding connecting pin mate, thereby completing the electrical circuit. The end result is an electric motor armature with the same electrical characteristics as a traditional armature, but at a much cheaper manufacturing cost.

- [8] These and other features of the present invention can be understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

- [9] Figure 1 is a schematic view of the electric motor armature of the present invention.
- [10] Figure 2 is a schematic view of the connecting circuitry of the circuit cap of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

- [11] Figure 1 shows an electric motor armature 10 of the present invention including cylindrical rotor casing 11 and circumferentially spaced straight wire bundles 12. Straight wire bundles 12 are molded or otherwise encased

circumferentially around rotor casing 11 and parallel to an axis that is defined by rotor casing 11. That is, the bundles preferably extend along what will be the rotational axis of the armature 10. Straight wire bundles 12 have end portions 13 that are connected by way of a circuit cap 14.

[12] As shown schematically in Figure 2, circuit cap 14 uses connecting pins 15 to connect each wire. Note that connecting pins 15 may be soldering pins or similar technology known to one of ordinary skill in the art. Each connecting pin 15 corresponds to a connecting pin mate 16 on circuit cap 14.

[13] A plurality of PCB board-type circuits 17 are embedded within the circuit cap 14 and connect each connecting pin 15 to its corresponding connecting pin mate 16, thereby forming a complete electrical circuit. Thus, an electric motor armature is produced with the same electrical properties as the traditional coiled wire armatures, but with increased efficiency and decreased cost.

[14] A preferred embodiment of this invention has been disclosed. However, a worker of ordinary skill in this art would recognize that certain modifications would come within the scope of this invention. For that reason, the following claims should be studied to determine the true scope and content of this invention.